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Filed : June 11, 1999

## AMENDMENTS TO THE CLAIMS

1-88 (Cancelled)

89. (Currently Amended) A multi-reaction site assay plate structure comprising:

an upper substantially planar, rigid surface and a lower closely spaced opposed and substantially planar, rigid surface, said upper and lower surfaces defining a space therebetween, a cavity between the upper surface and the lower surface holding a insert disc having the lower surface having a plurality of separate reaction sites, the reaction sites being treated to increase the hydrophilicity thereof, and the lower surface being treated to increase the hydrophobicity of the surface other than at said reaction sites;

at least one first opening in one of said upper and lower surfaces providing access to said space for introduction of fluid thereto from an external location, ~~the spacing between said upper and lower surfaces being sufficiently small to facilitate the flow of said fluid in said space by capillary action to substantially fill the space and cover all of the sites~~, the sites being such that when excess fluid is subsequently withdrawn through said at least one first opening some of said fluid is left at said sites; and

encoded information stored in at least one of said upper and lower surfaces so as to be readable by a scanned light beam, said encoded information including address information providing location information as to the part of said assay plate structure being scanned by the light beam.

90. (Previously Presented) The assay plate structure of claim 89 wherein the spacing is less than 1mm.

91. (Previously Presented) The assay plate structure of claim 89 wherein the spacing is less than 0.5mm.

92. (Previously Presented) The assay plate structure of claim 89 wherein said at least one first opening is configured to receive the end of a liquid injecting device, and said at least one first opening forms a substantially air-tight seal around said end.

93. (Previously Presented) The assay plate structure of claim 89 wherein the multi-reaction site structure is a disc which includes upper and lower circular plates, the internal surfaces of which respectively define said upper and lower opposed surfaces.

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94. (Previously Presented) The assay plate structure of claim 93 further comprising at least one second opening located at the peripheral edge of the disc.

95. (Previously Presented) The assay plate structure of claim 94 wherein the space between the upper and lower surfaces is subdivided, by one or more dividing walls, to provide a plurality of spaces, each space being provided with at least one of said first openings and at least one of said second openings to enable each space to be independently filled.

96. (Previously Presented) The assay plate structure of claim 93 wherein at least one of the upper and lower plates forming the structure are transparent to enable optical inspection of the sites from outside the structure.

97. (Previously Presented) The assay plate structure of claim 96 wherein the other of the upper and lower plates includes a reflecting surface for providing improved signal detection.

98. (Previously Presented) The assay plate structure of claim 89 wherein the plate structure is provided in the form of a disc and said encoded information is digitally encoded.

99. (Previously Presented) The assay plate structure of claim 98 wherein at least a portion of the plate structure is transparent for optical inspection of said reaction sites.

100-104. (Cancelled)

105. (Currently Amended) An optically transparent structure for conducting assays said structure comprising:

one or more chambers, each having an upper substantially planar, rigid surface and a lower closely spaced opposed and substantially planar, rigid surface, said upper and lower surfaces defining a space therebetween, and at least one of said upper and lower surfaces having at least one first opening for introduction of fluid therethrough into said one or more chambers, ~~the lower surface having a plurality of surface locations bearing a hydrophilic coating, the spacing between said upper and lower surfaces being provided to facilitate fluid flow by capillary action of a fluid introduced into said space through said at least one first opening to cover all of the locations bearing a hydrophilic coating;~~

at least one insert disc position within one of the chambers; and

encoded information stored in at least one of said upper and lower surfaces so as to be readable by a scanned light beam, said encoded information including address

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information providing location information as to the part of said structure being scanned by the light beam for at least one of said plurality of surface locations.

106. (Cancelled)

107. (Previously Presented) The structure of claim 105 wherein areas of said lower surface between said locations include hydrophobic coatings.

108. (Previously Presented) The structure of claim 105 wherein said surfaces are provided by respective upper and lower plates of a disc.

109. (Cancelled)

110. (Previously Presented) The structure of claim 108 wherein said encoded address information is provided for optical inspection of said at least one of said plurality of surface locations from exteriorly of said structure.

111. (Previously Presented) The structure of claim 105 wherein said at least one first opening is configured to receive the end of a liquid injecting device, and said at least one first opening forms a substantially air-tight seal around said end.

112. (Previously Presented) The structure of claim 105 wherein the structure is a disc which includes upper and lower circular plates, the internal surfaces of which respectively define said upper and lower opposed surfaces.

113. (Previously Presented) The structure of claim 112 further comprising at least one second opening located at a peripheral edge of the disc to vent said space.

114. (Previously Presented) The structure of claim 113 wherein the space between the upper and lower plates is subdivided, by one or more dividing walls, to provide a plurality of spaces, and each space being provided with at least one of said first openings and at least one of said second openings to enable independent access to each space.

115. (Previously Presented) The structure of claim 114 wherein the dividing walls are radially extending.

116. (Previously Presented) The structure of claim 112 wherein at least one of the upper and lower plates forming the structure is transparent to enable optical inspection of the surface locations from outside the structure, and the other of the upper and lower plates includes a reflecting surface.

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117. (Previously Presented) The structure of claim 105 arranged to receive one or more inserts.

118. (Previously Presented) The structure of claim 105 wherein the structure is provided as a sector of a disc.

119. (Previously Presented) The structure of claim 117 wherein the structure is made of plastic and said one or more inserts is snap-fitted onto the disc.

120. (Previously Presented) The structure of claim 119 wherein the structure and the disc include lock and key portions to allow the structure to be snap-fitted to the disc in a correct orientation only.

121. (Previously Presented) The structure of claim 105 including one or more lenses to improve the optical inspection of said surface locations.

122. (Previously Presented) The structure of claim 121 wherein said one or more lenses are molded into said structure.

123. (Currently Amended) A multi-reaction site assay plate structure comprising:  
~~an upper substantially planar, rigid surface and a lower closely spaced opposed and substantially planar, rigid surface, said upper and lower surfaces defining a space therebetween, and at least one of said upper and lower surfaces having at least one first opening for the introduction of a fluid therethrough into said space, the lower surface having a plurality of separate reaction sites, the reaction sites being treated to increase the hydrophilicity thereof, and the lower surface being treated to increase the hydrophobicity of the surface other than at said reaction sites, the spacing between said upper and lower surfaces being provided to facilitate the flow of fluid in said space by capillary action of a fluid introduced into said space through said at least one first opening to cover all of the sites;~~

at least one insert disc having a plurality of separate reaction sites; and  
~~encoded information stored in at least one of said upper and lower surfaces so as to be readable by a scanned light beam, said encoded information including address information providing location information as to the part of the assay plate structure being scanned by the light beam.~~

124. (Cancelled)

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125. (Previously Presented) The assay plate structure of claim 123 wherein said at least one first opening is configured to receive the end of a liquid injecting device, and said at least one first opening forms a substantially air-tight seal around said end.

126. (Previously Presented) The assay plate structure of claim 123 wherein the structure is an optically transparent disc which includes upper and lower circular plates, the internal surfaces of which respectively define said upper and lower opposed surfaces.

127. (Previously Presented) The assay plate structure of claim 126 further comprising at least one second opening located at a peripheral edge of the disc.

128. (Previously Presented) The assay plate structure of claim 127 wherein the space between the upper and lower plates is subdivided, by one or more dividing walls, to provide a plurality of spaces, each space being provided with at least one of said first openings and at least one of said second openings to enable each space to be independently accessed.

129. (Previously Presented) The assay plate structure of claim 126 wherein at least one of the upper and lower plates forming the structure are transparent to enable optical inspection of the sites from outside the structure.

130. (Previously Presented) The assay plate structure of claim 129 wherein the other of the upper and lower plates includes a reflecting surface.

131. (Previously Presented) The assay plate structure of claim 126 wherein said encoded address information is digitally encoded.

132-155. (Cancelled)

156. (Previously Presented) The assay plate structure of claim 89, wherein the reaction sites comprise wells configured to receive a portion of said fluid.

157. (Previously Presented) The structure of claim 105, wherein the surface locations bearing a hydrophilic coating comprise wells configured to receive a portion of said fluid.

158. (Previously Presented) The assay plate structure of claim 123, wherein the reaction sites comprise wells configured to receive a portion of said fluid.